

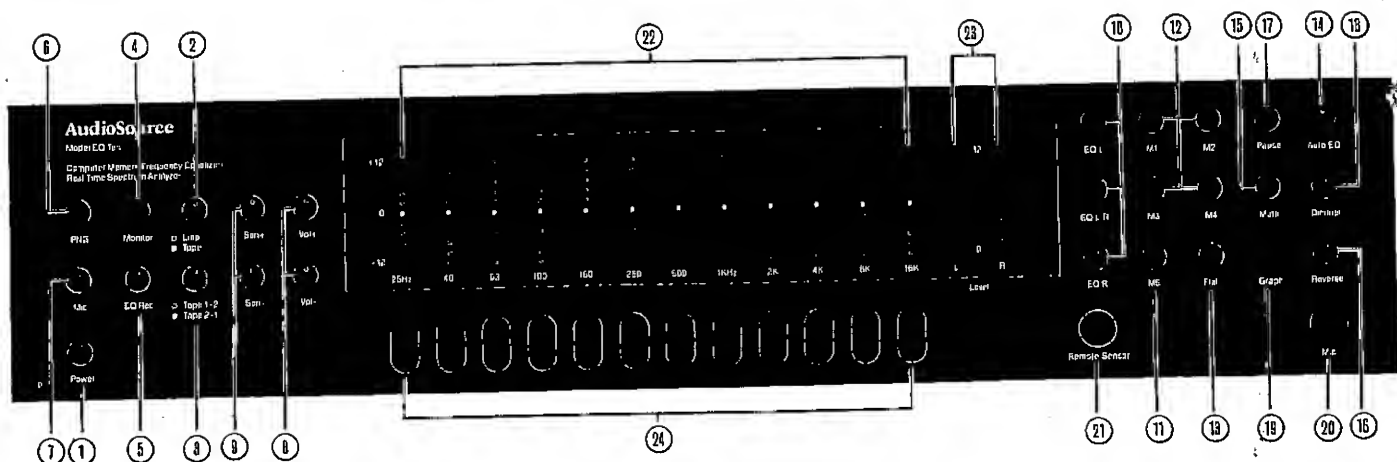
# Owner's Manual

# EQ TEN MANUAL

## Computerized Graphic Equalizer/Spectrum Analyzer with Auto EQ and Remote Control

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# AudioSource®



**OBS!**

TILL/FRAN-omkopplaren bryter inte anslutningen till elnätet. Funktionen är en s.k. stand by funktion och apparaten blir helt spänningsfri först när stickproppen dras ur vägguttaget.

## INTRODUCTION

Thank you for purchasing the AudioSource **EQ TEN** Computerized Graphic Equalizer/Spectrum Analyzer. It is a fully electronic unit with soft-touch controls, built-in Pink Noise Generator, and Calibrated Electret Condenser Microphone, that will enable you to automatically adjust each of the twelve bands per channel, while the results are displayed on the Spectrum Analyzer. The **EQ TEN** will help you maximize the potential of your audio system while compensating for the acoustical problems caused by room size, shape, furnishings and other sound reflecting surfaces.

The **EQ TEN**'s onboard computer will read the acoustics of your listening environment and set precise equalization settings for optimum sound reproduction. Or, you

can adjust each of the twelve bands manually to suit your personal preference. You can store your favorite equalization curves in the four separate memories, and recall them at the push of a button. Tape-to-tape dubbing and tape equalization are a breeze with the **EQ TEN**.

After everything is properly connected, you will be able to operate the **EQ TEN** from your favorite listening position with the thirty-two function, wireless remote control.

By spending a few minutes to read the operating instructions carefully, you will have years of enhanced listening pleasure.

## INSTALLATION

**PRECAUTIONS** - Please follow these simple steps when operating the **EQ TEN** or any electrical device.

**POWER PLUG** - Always grasp the plug when removing it from a socket. Never pull on the wires. Never remove or install the plug with wet hands, or electrical shock could occur. If you are not planning to use the unit for an extended length of time, it is wise to unplug it.

**REMOVAL OF CASE** - There are no user servicable parts inside the **EQ TEN**, so you should never remove the case of the unit, as risk of shock exists. Refer all servicing to qualified service personnel.

**INSTALLATION PRECAUTIONS** - Avoid installing your **EQ TEN**, or any electrical device, in areas exposed to direct sunlight, near heat radiating appliances, exposed to

moisture or humidity, exposed to dust and dirt, in areas with poor ventilation, directly on top of power amplifiers and other heat producing components, or on surfaces which are unstable or prone to vibrations.

**CLEANING** - Wipe the faceplate and case of the **EQ TEN** periodically with a soft cloth. Avoid using any thinners or volatile liquids to clean the **EQ TEN**.

### INPUT-OUTPUT JACKS AND CONNECTIONS

Before connecting the **EQ TEN** to your system, all units should be turned "off".

At the rear of your **EQ TEN**, you will find six sets of jacks which require cables with RCA plugs: **LINE**, **TAPE 1**, & **TAPE 2**. **TAPE 1** and **TAPE 2** allow you to run two different tape units through the equalizer. **LINE** supplies the link to your receiver or integrated amplifier. Connect the **LINE-IN** of the equalizer to **TAPE-RECORD** on your amplifier. Connect the **LINE-OUT** on the equalizer to **TAPE-IN** (or **MONITOR**) on your amplifier.

To connect your tape deck to the equalizer: **TAPE 1-IN** from the equalizer goes to **TAPE-OUT (PLAY)** on your tape deck. And **TAPE 1-OUT** from the equalizer goes to **TAPE-IN (REC)** on your tape deck. Make the same connections in **TAPE 2** to the second tape deck if you have one.

## ELECTRONIC CONTROLS

**R/C** : The remote control duplicates the basic functions.

**BEEP** : Pressing the button causes beep.

### ① Power **R/C**

Press to turn the equalizer ON. Press again to turn the power OFF.

### ② Line/Tape Source Selector

This switch determines which component will run through the equalizer. To listen to sound or record from a source connected to the **LINE** terminals jacks press the **Line/Tape** switch (indicator lights should be off). To listen to sound or record from a tape deck connected to the **TAPE** jacks, press the **Line/Tape** switch and the indicator will light up.

### ③ Tape 1-2 / 2-1

Pressing this switch shifts your listening between tape decks that are plugged into the **Tape 1** or **Tape 2** jacks. The indicator light turns on when **Tape 2** is selected or when dubbing from **Tape 2** to **Tape 1**.

When you record (dub) from one tape deck onto another, you must indicate with this switch which deck is the source and which is recording. If you are recording from **Tape 1** to **Tape 2**, press the **Tape 1-2** button (indicator light is off). If you are recording from **Tape 2** to **Tape 1**, press the **Tape 2-1** button (indicator light turns on).

### ④ Monitor

This button selects the source signal or output of the tape decks for monitoring.

### ⑤ EQ Rec

Press the **EQ Rec** switch to use the graphic equalizer while recording any source onto tape (indicator light turns on).

### ⑥ PNG (Pink Noise Generator) **R/C**

Press the **PNG** switch to activate the internal pink noise generator. It will override the other **LINE** and **TAPE** sources (indicator light turns on).

*Caution: Very high levels of pink noise may damage speakers. Be careful with the volume setting.*

### ⑦ MIC (Microphone Switch) **R/C**

Press the **MIC** switch when using the microphone to analyze the Pink Noise signal on the **Spectrum Display** (indicator light turns on). Be sure to slide the "on/off" switch on the microphone itself to the "on" (white dot) position whenever the microphone is used.

### ⑧ Vol + / Vol - (Volume Up/Volume Down) **R/C**

Press the **Vol+** once to increase the volume one step, or hold the button in for a continuous increase. Press the **Vol-** button once to decrease the volume one step, or hold the button in for continuous decrease.

### ⑨ Sen + / Sen - **R/C**

These two switches adjust the **Spectrum Display** Sensitivity to show the relative levels of the twelve frequency bands. As with the **Volume +** and **Volume -** switches, press either **Display Sen +** or **Sen -** switch once to increase or decrease the display one step, or hold in either switch to increase or decrease continuously. Adjust the display sensitivity so that low level signals will be displayed and high level signals do not peak out of range. These switches do not affect actual volume levels or equalization of the twelve frequency bands. They merely control the **Spectrum Display** Sensitivity.

### ⑩ Equalization Channel Selectors **R/C** **BEEP**

**EQ L/EQ R**: Press these buttons to adjust the left or right channel frequency levels through the **Equalization Level Controls**.

**EQ L-R:** Press this button to adjust both left and right channels simultaneously. If you have set R and L channels at different equalizations because of your room's acoustics, then in this setting the two channels will retain their distinctions yet raise and lower at the same rate.

**11 ME (Memory Entry)** **R/C** **BEEP**

This switch prepares the **EQ TEN** to store an Equalization Curve in its memory. After establishing the frequency setting you want with the Equalization Controls, press the ME switch. The indicator in the switch will flash, showing that the memory is ready to receive the curve. When you press one of the four Memory Preset Switches (M1-M4), the curve is stored and the Memory light will stop flashing. If you want to cancel the command for the Memory to receive a curve, simply press the Memory button again. The light will stop flashing.

**12 Memory Preset Switches M1, M2, M3, M4**

**R/C** **BEEP**

Each of these four switches has two functions: to store an Equalization Curve setting in the Memory and to recall that curve in the future.

**To store:** When you have established an Equalization Curve that you want to preserve, press ME and notice its flashing light. Then press the Preset switch you want to store the setting in (M1-M4), either filling an empty spot or overriding a previous setting. That setting will remain in the Memory until you override it. You may want to make a note of what setting you have put into each Memory bank (i.e.: M1 - CD, M2 - Tuner, M3 - Tape, and M4 - Turntable; or M1 - Rock, M2 - Jazz, M3 - Pop, and M4 - Classical).

**To recall:** Simply press a Memory Preset Switch (M1 - M4) to recall its setting from the Memory. You can change the setting at that moment without losing the memory by pressing any one or more of the twelve Equalization Level controls. This way you can alter the remembered setting and still return to it by pressing the Memory Preset Switch again. An indicator light signifies which Memory Preset Switch is activated.

**Important:** When a power line interruption occurs, the information stored in the memory will be erased. Therefore we suggest that you write down the settings you have stored for future reference.

**13 Flat** **R/C** **BEEP**

Press this switch for a flat response, leveling all frequency adjustments to the "0" dB level (indicated by the green row of lights on the Display).

**14 Auto EQ** **R/C** **BEEP**

Plug in the microphone and locate it at a typical listening location. Turn on the pink noise and raise the volume to a normal listening level. Set the display to the Spectrum

mode, then press the Auto EQ button. The **EQ TEN** will analyze the pink noise sound and the microprocessor will automatically set a flat response curve. This switch should be used in conjunction with the Microphone/Pink Noise Generator, although it will automatically equalize any signal coming through the microphone or line inputs. Given your room's acoustics, it will automatically establish a flat response.

**15 Mute** **BEEP**

Press this switch to mute the sound without interrupting the source or changing the volume setting. Press again to restore the sound at precisely the same volume.

**16 Reverse** **BEEP**

Reverse allows you to play back a tape which you have recorded at a particular equalizer setting and hear it played back at a flat level.

**17 Pause** **BEEP**

Press the Pause switch when the Display is working in the Spectrum mode, that is when the twelve light indicators are moving with the sound fluctuations. This switch has three functions:

- A. Press it once and the Spectrum Display will hold the highest level that has registered in the display and hold it for three seconds or until that level has been overtaken by a higher reading, which in turn will be held for three seconds or until overtaken. Essentially, this function holds the indicators at the peaks so you can read several levels before the lights fall back down.
- B. When you press and hold the switch in, it will freeze the Spectrum Display, so you can study a specific moment of sound, such as a crescendo, the entrance of an unusual instrument, or a deep voice.
- C. Press the switch again to take out the feature described in step A.

**18 Dimmer** **BEEP** **R/C**

Press the Dimmer switch to decrease the intensity of the Display lighting. Press it again to restore full illumination.

**19 Graph** **BEEP** **R/C**

This switch alternates the equalizer Display between the Graphic and Spectrum modes. The display will automatically return to the Spectrum mode in fifteen seconds, or you can manually return to the Spectrum mode by pressing the switch again.

**20 Microphone Jack**

This is where you connect the supplied microphone for

testing your listening room's acoustical response to pink noise. You will use this in conjunction with the **PNG** switch and **MIC** switch.

**Important:** Only use the **EQ TEN** microphone supplied with your unit. Do not attempt to plug in any other device (i.e. some other microphone or headphone) as it may cause damage to your equalizer.

**Note:** The microphone uses one UM-3 ("AA" size) battery. Be sure the battery is inserted correctly. Inside the case you will see the correct graphics. If you will not be using the microphone for several weeks, remove the battery from its compartment.

#### ②① Remote Sensor Window

This receives the signal from the wireless remote control unit. Be sure that nothing blocks this window, as the remote signal will then be blocked too.

#### ②② Graphic/Spectrum Display

The function of the Display is controlled by the Graphic/Spectrum switch and the twelve Equalization Level switches just below the Display. This Display doubles as a Graphic/Spectrum Display. You can alternate between these two modes by using the Graph switch.

##### A. As a Graphic Indicator:

It shows the cut or boost of each individual frequency band; 25 Hz to 16 KHz. The light in each band changes its position, corresponding to a boost or cut, when you press the Equalization Level switch just below it. After 15 seconds, if no other buttons are pressed the display automatically goes back to Spectrum Display mode.

##### B. As a Spectrum Indicator:

It shows the fluctuating output signal in each of the twelve frequency bands as the sound passes through the equalizer. To make viewing easier, the indicator lights fall more slowly than they rise. When in the Spectrum mode, the Display will shift over to the Graph mode for about fifteen seconds and then back whenever you press any of the following switches: Equalization Level Up/Down switches, Memory-Preset switches (M1-M4), ME Switch, Flat switch, Reverse switch, EQ L, EQ R, EQ L-R, or Auto EQ switches. You can make the Display return to Spectrum immediately by pressing the Graph switch.

#### ②③ Average Level Indicator: L-Channel/R-Channel

Located at the far right side of the Display, this indicator shows the relative input level for each channel.

#### ②④ Equalization Level Up/Down Controls **R/C** **BEEP**

Each switch controls one frequency band between the range 25Hz to 16KHz, and cut or boost of each band can be varied a total of +/-12dB by pressing the top (up) or bottom (down) portion of each switch. When you press one of the Equalization Level switches, the Display above immediately shifts into the Graphic mode and shows you the settings of all twelve bands. After about fifteen seconds, the Display shifts back into the Spectrum mode. Adjust the equalization level one band, one switch at a time. Press a switch once and the level changes one step. Hold the switch in and the level changes continuously.

## EQUALIZING MUSIC

The fundamental range for most instruments falls between 63Hz and 4.5KHz, easily within the range of human hearing and your equalizer's control. Within this fundamental range instruments sound surprisingly similar, whereas the overtones or harmonics above the fundamental range give each instrument its timbre, its distinct character. Still, it is the mid-range controls that you will hear the greatest effect upon the sound coming through the equalizer and your speakers. Therefore, smaller changes in the mid range settings will produce more noticeable sound alteration while larger changes in the outer octaves of extreme high and low frequencies will produce less apparent effects.

Total power response, sound reflection included, is the most significant influence in our perception of tonal balance. Direct sounds that are not reflected off of walls,

curtains, furniture, etc..., determine our ability to locate instruments in the composite sound. The **EQ TEN** gives you the power to adjust each channel separately; we only recommend doing so if your speakers are arranged in an asymmetrical environment. In a symmetrical room and speaker arrangement you will probably want to use the same equalization curve for both speakers to achieve the best stereo imaging. If your environment or speakers are different, you may want to equalize them separately.

When recordings are made, microphones are often placed so close to the instruments that they capture mostly direct sound, losing the roll-off produced by the reverberant sound. Therefore, the flat response of a hi-fi system will tend to reproduce higher frequencies more intensely than one would hear during a live performance. You may find in many instances that a slight diminishment or roll-

off in the high frequencies will produce a more realistic and satisfying sound, particularly at the 16KHz level.

**Caution:** Extreme boosts of lower bass or higher treble frequencies can overload the capacity of your amplifier or speakers, causing distortion in the amplifier or damage to

your speakers. Therefore, exercise moderation in the highs and lows. Also, since the tone controls on your preamp or receiver and the Equalization Level controls on the equalizer both affect the tone frequency level, their effect is cumulative. We recommend leaving the tone controls and/or contour boost switch of your preamplifier or receiver in the flat position.

## PINK NOISE GENERATOR OPERATION

The Pink Noise Generator produces a uniform volume or signal intensity in the entire frequency band. Since your listening room greatly influences the sound you hear, you can set a flat response at all levels of frequency by using the Pink Noise Generator and a microphone.

1 Plug the microphone into the MIC jack and place it where you normally listen.

2 Press the MIC switch.

3 Press the Graph switch so the Display is in Spectrum mode.

4 Press the Flat switch in order to bring all settings to the zero dB level.

5 Lower the volume on your receiver or preamp. To activate the Pink Noise Generator, press the PNG switch (indicator light will turn on). Carefully turn up the volume on your preamp or receiver and you will hear an airy rushing sound, similar to the hiss between FM stations. Turn the volume up as loud as the loudest music you listen to. Since your speakers are not designed to play back pink noise, do not raise the volume too much or you may damage the speakers. If you set the volume too low, however, you will not get accurate sound measurements.

6 You should analyze and equalize the left and right channels separately. So press the EQ L first.

7 The easiest way to equalize is to take advantage of the built in microprocessor in your **EQ TEN**. Just press the

Auto EQ switch and your system will be equalized to your room's acoustics. You can further fine tune the equalization with the individual frequency boost or cut buttons. Due to your room's acoustics, your speaker or amplifier, you may not be able to set the lows and highs (25-40Hz, 8-16KHz) at a flat level relative to the mid-range frequencies. Try to set as close to flat as you can.

8 If the Display reads too low or high when you are satisfied with the volume, adjust it with the Display Sen +/ Sen- switches to bring the Display into the middle of the screen.

9 Now you can read the Spectrum Display and see how each of the twelve frequency levels needs adjustment.

10 To equalize the right channel, press the equalizer's EQ-R switch and follow the same procedure as the left channel.

11 Once you have equalized both channels, store the setting in the Memory. First press the ME switch (the light will flash) and then press M1, M2, M3, or M4. Both left and right channel settings will be stored at once. You can recall the setting any time by pressing whichever of the four memories you stored the curve in.

12 Since you have four Preset Memory switches, you can store four different settings, compare them and pick the one you prefer for different music (Rock, Classical, Jazz, Pop etc..) or different sources (Record Player, CD, Tuner, Tape) or four different locations in your listening room.

## REMOTE CONTROL OPERATION

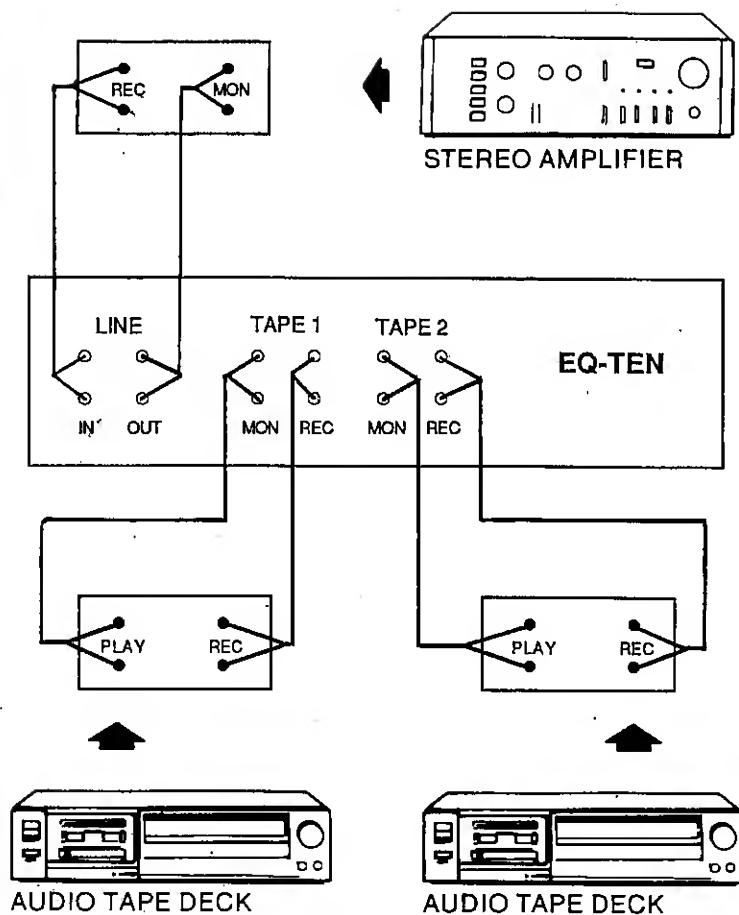
The Remote Control unit will perform most of the functions that you can accomplish at the front of your **EQ TEN**. Simply point it toward the Remote Sensor Window in the front of the equalizer and press the function you want to activate. The buttons are self explanatory if you know how the switches work on the main unit.

However, notice that to operate the Equalization Level controls, you must first activate the band you want by pressing the frequency button **(A)**, 250Hz for instance,

and then alter the level by pressing the EQ + or EQ - buttons **(B)**. After changing the 250 Hz setting, you can work with any other band, say 500 Hz, by pressing the 500 Hz button and then working the EQ + or EQ - buttons.

### Note:

The remote control uses two UM-3 ("AA" size) batteries. Be sure the batteries are inserted correctly. Inside the case you will see the correct graphics. If you will not be using the Remote Control unit for several weeks, remove the batteries from its compartment.



Instrument	Fundamental Note Range (Hz)	Harmonic/Overtone Range (Hz)
KICK DRUM	31.5 - 125	31.5 - 125
SNARE DRUM	250 - 16,000	250 - 16,000
CYMBALS	500 - 16,000	500 - 16,000
CHIMES	125 - 4,000	125 - 4,000
BASS GUITAR	63 - 2,000	63 - 2,000
LEAD GUITAR	125 - 8,000	125 - 8,000
FEMALE VOCAL	125 - 4,000	125 - 4,000
MALE VOCAL	125 - 2,000	125 - 2,000
SAXOPHONE	250 - 4,000	250 - 4,000
ORGAN	31.5 - 16,000	31.5 - 16,000
PIANO	31.5 - 16,000	31.5 - 16,000
STRING BASS	63 - 2,000	63 - 2,000
VIOLIN	250 - 8,000	250 - 8,000
CELLO	125 - 4,000	125 - 4,000
CLARINET	250 - 8,000	250 - 8,000
FLUTE	500 - 4,000	500 - 4,000
TRUMPET	125 - 4,000	125 - 4,000

Legend: — Fundamental note      - - - - - Harmonic or overtone

## Specifications

### MAIN UNIT

#### EQUALIZER SECTION

Frequency Response	5Hz - 120KHz $\pm 1$ dB
Gain (Flat Position)	Unity Gain ( $\pm 1$ db)
Distortion	0.008% at 1V Output
Hum & Noise	-99.7dB re 1V
Maximum Input	4.0V
Minimum Input	4.0V
Input Impedance	47K ohms
Output Impedance	600 ohms
Control Center Points	25, 40, 63, 100, 160, 250, 500Hz
	1K, 2K, 4K, 8K, 16KHz
Control Range	$\pm 12$ dB

#### REAL TIME ANALYZER SECTION

LED Display	154 (12 Green, 142 Red)
Input Impedance	47K ohms
Display Range	$\pm 12$ dB
Display Mode	Instantaneous Response, Momentary Peak Hold, Continuous Peak Hold

#### MICROCOMPUTER

Four frequency curve memories.
Set "Flat" Function
Reverse Equalization

#### PINK NOISE GENERATOR SECTION

Output Level	150mV
Impedance	600 ohms
Frequency Response	Better than 20 Hz to 16KHz $\pm 3$ dB

SIZE	19"W x 3.5"H x 8.75"D
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WEIGHT	7 lbs. 11oz.
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#### REMOTE CONTROL TRANSMITTER

Type	Infrared Remote Control
Batteries	1.5V Type "AA" x 2
Dimensions	2.5"W x 6.7"H x 0.7"D

#### MICROPHONE

Type	Electret Condenser
Sensitivity	-70dB at 1000Hz $\pm 3$ dB
Impedance	600 ohms
Directionality	Omnidirectional
Frequency Response	25 - 16,000Hz
Battery Requirement	1.5V Type "AA"

*Designs and specifications subject to change without notice.*

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